

## Desmoscolecids from the Demerara abyssal basin off french Guiana (Nematoda, Desmoscolecida)

by Wilfrida DECRAEMER

**Résumé.** — Quatre nouvelles espèces de desmoscolecides sont décrites : *Desmoscolex demerarae* sp. nov., *Quadricomoides trilabiata* sp. nov., *Q. labiosus* sp. nov. et *Spinodesmoscolex coronatus* gen. n., sp. nov. Le nouveau genre *Spinodesmoscolex* est caractérisé par les anneaux du corps de forme desmoscolecoïde, portant des rangées transversales de soies épineuses, et par la tête à extrémité antérieure triradiée avec trois zones labiales.

**Abstract.** — Four new species of desmoscolecids are described : *Desmoscolex demerarae* sp. nov., *Quadricomoides trilabiata* sp. nov., *Q. labiosus* sp. nov. and *Spinodesmoscolex coronatus* gen. n., sp. nov., the latter belonging to a new genus *Spinodesmoscolex*. *Spinodesmoscolex* is characterized by desmoscolecoid body rings with transverse rows of spine-like setae and by the head with triradial anterior end provided with three labial areas.

W. DECRAEMER, Koninklijk Belgisch Instituut voor Natuurwetenschappen, Vautierstraat 29, B-1040 Brussel, Belgium.

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This paper deals with a study of desmoscolecids collected during the "Demeraby" cruise in the Demerara abyssal basin near the Amazone cone, organized by CNEXOCOB with the collaboration of the Muséum national d'Histoire naturelle, Paris. The program of the "Demeraby" mission concerns deep-sea ecology of an environment expected to be submitted to large continental influence near the Amazone cone. A large number of samples were taken from two stations, A and B, respectively at about 4 400 m and 4 800 m depth. The material was kindly put at my disposal by Dr M. SEGONZAC<sup>1</sup>.

The Demerara abyssal benthic fauna is rich in peculiar and very interesting species. Four new species were found : *Desmoscolex demerarae* sp. nov., *Quadricomoides trilabiata* sp. nov., *Q. labiosus* sp. nov. and *Spinodesmoscolex coronatus* gen. n., sp. nov., belonging to a new genus *Spinodesmoscolex*.

### MATERIAL AND METHODS

The samples with desmoscolecids were taken by box corers (KG) with large surface (USNEL 0.25 m<sup>2</sup>) or by a beam-trawl with 6 m opening (CP). In order to recover the organisms of meiofaunal size, the sediments collected by these gears were sieved on a 250 µm mesh. Desmoscolecid specimens were found in the samples from station B, Demerara abyssal basin, listed in table I.

All type material is deposited in the Muséum national d'Histoire naturelle, Paris (see on table I).

1. Head of the "Centre national de tri d'océanographie biologique (CENTOB)", Brest, France.

TABLE I. — Location of species.

Nº SLIDES COL. MNHN	SAMPLE	METHOD SAMPLING LENGTH DREDGING	LOCATION	DEPTH (m)	SPECIES
AN 319, AN 331	88	KG15	10°24.11' 46°46.73'	4 850	<i>Quadricomoides labiosus</i> 1 ♀ <i>Quadricomoides trilabiata</i> 1 ♀
AN 333	98	KG18	10°22.72' 46°48.10'	4 850	<i>Q. trilabiata</i> 1 ♂
AN 327	101	KG19	10°23.24' 46°46.71'	4 850	<i>Q. trilabiata</i> 1 ♂
AN 324	103	KG20	10°23.67' 46°47.98'	4 850	<i>Spinodesmoscolex coronatus</i> 1 ♂ <i>Q. trilabiata</i> 1 ♂
AN 318, AN 326	116	KG21	10°24.85' 46°46.65'	4 850	<i>Q. trilabiata</i> 2 ♂♂
AN 330	117	CP11/1 400 m	10°23.16' 46°46.63' 10°23.83' 46°47.08'	4 850	<i>S. coronatus</i> 1 ♀
AN 323	118	KG22	10°24.02' 46°48.03'	4 850	<i>Q. trilabiata</i> 1 ♂ <i>S. coronatus</i> 1 ♀
AN 322	120	KG23	10°23.40' 46°45.14'	4 850	<i>Q. trilabiata</i> 1 ♀
AN 317, AN 325	125	KG25	10°22.41' 46°46.74'	4 850	<i>S. coronatus</i> 1 ♀
AN 320	126	KG26	10°22.41' 46°46.74'	4 830	<i>Q. trilabiata</i> 1 ♂, 3 ♀♀
AN 329	131	KG27	10°23.02' 46°45.08'	4 830	<i>Q. trilabiata</i> 1 ♀
AN 321	133	CP14/1 700 m	10°24.32' 46°46.02' 10°25.14' 46°46.26'	4 830	<i>Q. trilabiata</i> 1 ♀ <i>Q. labiosus</i> 1 ♀
AN 332	143	KG28A	10°23.17' 46°45.47'	4 850	<i>Q. labiosus</i> 1 ♂ <i>Q. trilabiata</i> 2 ♀♀ <i>Quadricoma</i> sp. 1 ♀
AN 334	143	KG28B1	10°23.17' 46°45.47'	4 850	<i>Desmoscolex demerarae</i> 3 ♂♂ <i>Q. trilabiata</i> 1 ♂
AN 335	143	KG28B2	10°23.17' 46°45.47'	4 850	<i>Q. labiosus</i> 1 ♀
AN 328	144	KG29	10°23.09' 46°47.59'	4 850	<i>Q. trilabiata</i> 1 ♂ <i>Desmoscolex</i> sp. 1 ♀

ABBREVIATIONS USED : L, body length ; hd, maximum head dimensions : width by length (length without neck-zone) ; cs, length of cephalic setae ; sd<sub>n</sub>, length of sub-dorsal setae on main ring n ; sv<sub>n</sub>, length of sub-ventral setae on main ring n ; sl<sub>n</sub>, length of sub-lateral setae on main ring n ; oes, length of oesophagus ; t, tail length ; tnr, length of terminal ring ; tnrw, maximum width of terminal ring ; (tmrw), maximum width of terminal ring, desmos not included ; mbd, maximum body diameter ; (mhd), maximum body diameter foreign material or desmos not included ; spic, length of spicules measured along the median line ; gub, length of gubernaculum ; V, distance

of vulva from anterior body end as percentage of total body length ; a, b, e, proportions of de Man. All measurements are in micrometers ( $\mu\text{m}$ ).

## DESCRIPTIONS

### Subfamily DESMOSCOLECINAE Shipley

#### Genus **SPINODESMOSCOLEX** gen. n.

**DIAGNOSIS :** Desmoscolecinae. Desmoscolecoid body rings, each ring with a transverse row of spine-like setae surrounded by concretion ; head with triradial anterior end composed of three labial arcas, each arca with two papillae ; oesophagus about cylindrical and very short.

**TYPE SPECIES :** *Spinodesmoscolex coronatus* sp. nov.

#### **Spinodesmoscolex coronatus** sp. nov.

(Figs. 1-2)

**MATERIAL :** 1 ♀ holotype (slide AN 323). — Paratypes : 1 ♀ (slide AN 330), 1 ♂ (slide AN 324), 1 ♀ (slide AN 325) anterior body region with head cut off, head female (slide AN 317).

**MEASUREMENTS :** *Holotype female* :  $L = 1245$ ,  $hd = 46 \times 54$ ,  $sd_1 = 75$ ,  $sd_3 = 65$ ,  $sd_5 = 59$ ,  $sd_7 = 62$ ,  $sd_9 = 42$ ,  $sd_{11} = 57$ ,  $sd_{13} = 50$ ,  $sd_{17} = 54$ ,  $sd_{22} = 95$ ,  $sv_2 = 33$ ,  $sv_4 = 37$ ,  $sv_6 = 42$ ,  $sv_8 = 44$ ,  $sv_{10} = 51$ ,  $sv_{12} = 52$ ,  $sv_{14} = 58$ ,  $sv_{16} = 42$ ,  $oes = 59$ ,  $t = 325$ ,  $tmr = 129$ ,  $mbd = 119$ ,  $(mbd) = 92$  ;  $b = 21.1$ ,  $c = 3.5$ . — *Paratype female* ( $n = 1$ ) :  $L = 1255$ ,  $hd = 48 \times 55$ ,  $es = 32$ ,  $sd_1 = 86$ ,  $sd_{23} = 110$ ,  $sv_2 = 37$ ,  $sv_4 = 39$ ,  $sv_7 = 47$ ,  $sv_9 = 48$ ,  $sv_{13} = 53$ ,  $sv_{17} = 74$ ,  $oes = 62$ ,  $t = 332$ ,  $tmr = 135$ ,  $mbd = 124$ ,  $(mbd) = 102$  ;  $b = 20.2$ ,  $e = 3.5$ . — *Paratype male* ( $n = 1$ ) :  $L = 915$ ,  $hd = 36 \times 43$ ,  $es = 29$ ,  $sd_1 = 66$ ,  $sd_3 = 60$ ,  $sd_5 = 54$ ,  $sd_7 = 52$ ,  $sd_9 = 52$ ,  $sd_{11} = 45$ ,  $sd_{13} = 52$ ,  $sd_{17} = 52$ ,  $sd_{21} = 81$ ,  $sv_2 = 30$ ,  $sv_4 = 36$ ,  $sv_6 = 38$ ,  $sv_8 = 37$ ,  $sv_{10} = 37$ ,  $sv_{12} = 38$ ,  $sv_{14} = 44$ ,  $sv_{16} = 43$ ,  $oes = 53$ ,  $t = 260$ ,  $tmr = 99$ ,  $mbd = 108$ ,  $(mbd) = 93$ ,  $spic = 72$ ,  $gub = 35$  ;  $b = 17.2$ ,  $c = 3.9$ .

## DESCRIPTION

Body long, tapered towards the extremities, especially in tail region. Cuticle with 22 broad main rings in holotype female (21 rings in paratype male, 23 rings in paratype female), separated by an equally wide or a wider interzone (except on tail). Interzone with 2 to 3 narrow cuticular rings ; each ring with a transverse row of minute hairy spines with fine foreign material caught between them. Main rings provided with a transverse row of spine-like setae, 38-72  $\mu\text{m}$  long, almost completely surrounded by concretion. Spine-like setae directly inserted on body cuticle. Holotype female with 8 spine-like setae on the first main ring, 12 on the 12 th ring, 8 on the 13 th main ring, 9 on the anal ring. No glands observed at their base. Spine-like setae with central canal.

Head longer than wide. Cuticle covered by a layer of fine and coarse foreign particles, except in the labial region and in the center part near the amphidial pore. Anterior end triradial, composed of 3 labial areas (lips), each area with 2 endings of labial sensilla of the inner crown (?); in front view an indication of the outer crown of labial sensilla was observed (fig. 1A, 1a). Anterior end coronated by a membrane. Posterior head border with 1 or 2 spine-like setae with concretion.

Cephalic setae 29-32  $\mu\text{m}$  long, inserted on short peduncles on the anterior half of the head.

Arrangement of somatic setae typical desmoseolceoid, with 9 pairs of sub-dorsal setae and 8 pairs of sub-ventral setae (LORENZEN, 1969). Somatic setae differ, the sub-dorsal ones have a broader shaft with spatulate distal end (more or less pronounced), where as the sub-ventral setae are fine, tapering to a fine tip. The somatic setae inserted on raised euticular pedicels with their distal half naked and protruding from the concretion rings. The sub-dorsal setae on main rings 1 and 3 are longer than on the other sub-dorsal setae; the terminal pair on main ring 22 (holotype female), main ring 21 or 23 (paratypes) is conspicuously elongated. Sub-ventral setae shorter than sub-dorsal ones, becoming longer caudally. Amphids large, rounded, more or less elongated vesicular structures. Anteriorly extending close to the labial region or to about the level of the insertion of the cephalic setae and posteriorly reaching to the first interzone or to halfway the first main ring. Amphids nearly completely lying on a thick layer of concretion, even when becoming loose from the body-wall behind the head-region. Amphidial pore near the level of the insertion of the cephalic setae. Ocelli absent or situated at the level of the interzone between main rings 3 and 4.

Stoma small, thick-walled, marked off. Oesophagus conspicuously short, extending to the first interzone or to the anterior half of the first main ring. Oesophagus about cylindrical, with a slight indentation halfway its length and at the posterior end. Nerve ring presumably at posterior end of oesophagus. Front of intestine with long narrow (finely granular) ventricular part, widening behind into a broad cylinder filled with small and large globules; intestine overlapping the rectum posteriorly.

#### *Male*

Body slightly shorter than in females. Somatic setae arranged as follows: sub-dorsal, right side 1 3 5 7 9 11 13 17 21 = 9; left side 1 3 5 7 9 11 13 17 21 = 9 — sub-ventral, right side 2 4 6 8 10 12 14 16 = 8; left side 2 4 6 8 10 12 14 16 = 8.

Testis single. Spicules 72  $\mu\text{m}$  long, corpus slightly tapered distally to a point and proximally with a hardly differentiated capitulum. Gubernaculum, a thin rod-like structure, 35  $\mu\text{m}$  long. Cloacal tube broad, clearly protruding from the medio-ventral body wall in main ring 16. Tail tapering posteriorly, consists of five main rings. Terminal ring 99  $\mu\text{m}$  long, tapering posteriorly to a 23  $\mu\text{m}$  long, fine and naked spinneret. Its front part provided with two spine-like setae with concretion. Phasmata present. Terminal pair of sub-dorsal setae inserted in anterior half of terminal ring.

#### *Females*

Somatic setae arranged as follows: Holotype ♀, sub-dorsal, right side 1 3 5 7 9 11 13 17 22 = 9; left side 1 3 5 7 9<sup>1</sup> 11 13 17 22 = 9 — sub-ventral, right side 2 4 6

1. Setae broken off.

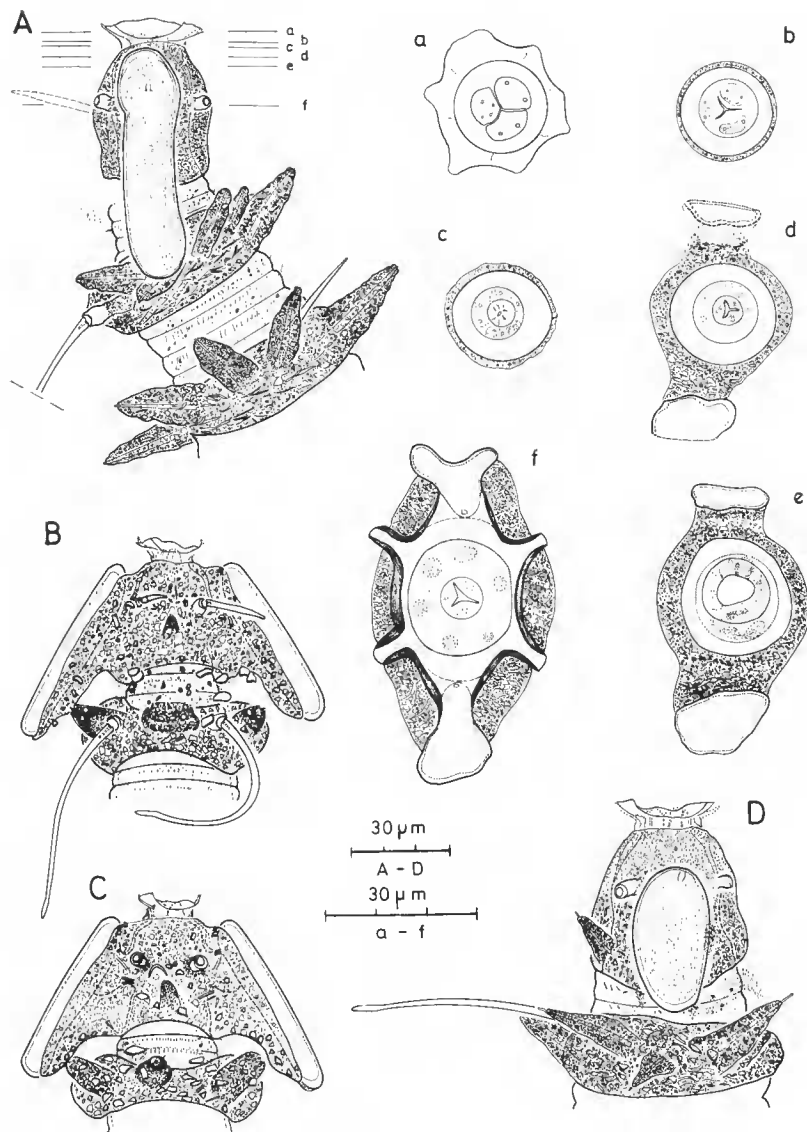


FIG. 1. — *Spinodesmoscolex coronatus* gen. n., sp. nov. : A, surface view of head (♀ paratype) showing levels at which the transverse optical sections a-e were made ; B, surface view of dorsal side of head (♂ paratype) ; C, surface view of ventral side of head (♂ paratype) ; D, surface view of head of holotype female.

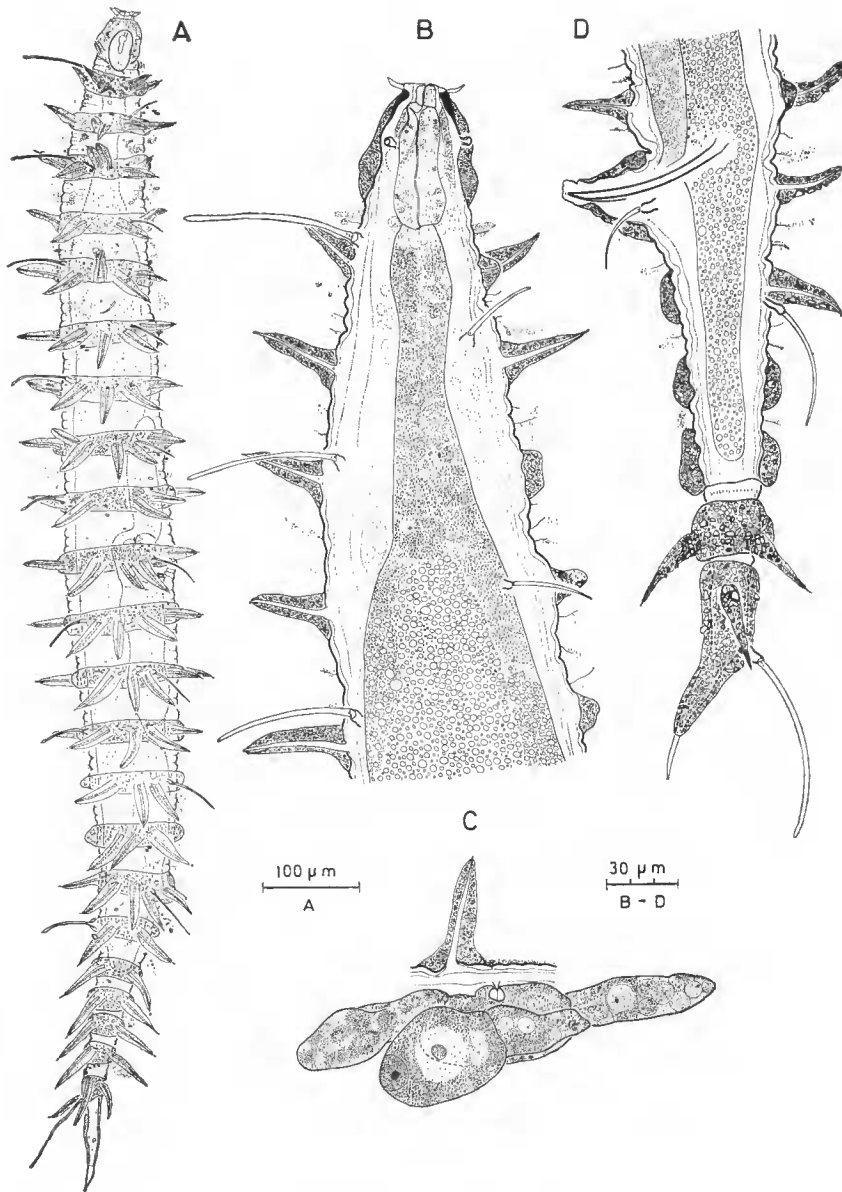


FIG. 2. — *Spinodesmoscolex coronatus* gen. n., sp. nov. : A, holotype female, entire specimen ; B, anterior body region of holotype female ; C, female reproductive system (paratype) ; D, posterior body region (♂ paratype).

8 10 12 14 16 = 8; left side 2 4 6 8 10 12 14 16 = 8. — Paratype ♀, sub-dorsal, right side 1 3<sup>1</sup> 5<sup>1</sup> 8<sup>1</sup> 10<sup>1</sup> 12<sup>1</sup> 14<sup>1</sup> 19<sup>1</sup> 24 = 9; left side 1 3<sup>1</sup> 5<sup>1</sup> 8<sup>1</sup> 10<sup>1</sup> 12<sup>1</sup> 14<sup>1</sup> 19<sup>1</sup> 24 = 9 — sub-ventral, right side 2 4 7 9 11<sup>1</sup> 13 15<sup>1</sup> 17 = 8; left side 2 4 7 9 11 13 15<sup>1</sup> 17 = 8.

Reproductive system didelphic-amphidelphic. Both branches of the genital system overlapping each other at the level of the vulva. Two spermathecae. Vulva situated at the anterior end of the interzone between main rings 10 and 11 (holotype) or 11 and 12 (paratype). Anal tube large, protruding from the medio-ventral body-wall at posterior half of main ring 16 (holotype) or 17 (paratype). Tail tapering posteriorly, consisting of 6 main rings. Terminal ring, 129-135 µm long, anteriorly with a transverse row of five spine-like setae (holotype) or two (paratype), tapering posteriorly to a spinneret. Phasmata present in posterior half of the terminal ring.

TYPE LOCALITY : Demerara abyssal basin off French Guiana, station B, at 10°24.02'/46°48.03', at 4850 m depth, collected on 25-IX-1980.

DIAGNOSIS : *Spinodesmoscolex coronatus* gen. n., sp. nov. has 21-23 main body rings provided with large spine-like setae surrounded by concretion, an anterior head-end with three lips coronated by a membrane, a typical desmoscolecoid setal pattern in male and female, with a conspicuously elongated pair of terminal setae and a very short oesophagus almost restricted to the head-region.

#### REMARKS

The character of 'triradial anterior head-end with three lips' observed in *Spinodesmoscolex* was known only from *Quadricomoides* Decraemer, 1976 (Meyliidae, Tricominae). Its presence in *Spinodesmoscolex* is the first record of this character within the Desmocolecidae.

The presence of large spine-like setae on the main rings was never recorded before for the Desmoscolecida. These spine-like setae possess a fine inner canal; no glandular structures nor nerve endings in connection with them were found. However, the spine-like setae may be homologue with the fine tubes or spines found in the middle of the main rings (after removal of the desmos) in several desmoscolecids e.g. in *Desmoscolex apud asetosus* in DECRAEMER (1975b).

#### Genus **DESMOSCOLEX** Claparède

*Desmoscolex* Claparède, 1863 : 59.

#### **Desmoscolex demerarae** sp. nov.

(Fig. 3)

MATERIAL : 1 ♂ holotype (slide AN 334). — Paratypes : 2 ♂♂ (slide AN 334).

MEASUREMENTS : *Holotype male* : L = 800, hd = 27 × 27, cs = 14, sd<sub>1</sub> = 49, sd<sub>3</sub> = 44, sd<sub>5</sub> = 32, sd<sub>7</sub> = 34, sd<sub>9</sub> = 34, sd<sub>11</sub> = 29, sd<sub>13</sub> = 32, sd<sub>15</sub> = 38, sd<sub>18</sub> = 43, sd<sub>19</sub> = 54, sl<sub>2</sub> = 13,

1. Setae broken off.

sv<sub>4</sub> = 18, sv<sub>6</sub> = 18, sv<sub>8</sub> = 18, sv<sub>10</sub> = 19, sv<sub>12</sub> = 14, sv<sub>14</sub> = 16, sv<sub>16</sub> = 22, sl<sub>16</sub> = 25, t = 160, tnr = 83, spinneret = 5, spic = 54, gub = 22, oes = 50, mbd = 92, (mbd) = 62. — *Paratype males* (n = 2) : L = 730-810, hd = 23-24 × 24, cs = 10-13, sd<sub>1</sub> = 39-45, sd<sub>3</sub> = 36, sd<sub>5</sub> = 32-33, sd<sub>7</sub> = 30-32, sd<sub>9</sub> = 28-33, sd<sub>11</sub> = 29-34, sd<sub>13</sub> = 29-33, sd<sub>16</sub> = 36-37, sd<sub>19</sub> = 38, sl<sub>2</sub> = 14, sv<sub>4</sub> = 17, sv<sub>6</sub> = 17, sv<sub>8</sub> = 18-19, sv<sub>10</sub> = 15-17, sv<sub>12</sub> = 15-16, sv<sub>14</sub> = 17-18, sv<sub>15</sub> = 14-16, sv<sub>16</sub> = 20, sl<sub>17</sub> = 18, t = 146-162, tnr = 79, spinneret = 3-3.5, spic = 55-56, gub = 20, oes = 42-48, mbd = 80-92, (mbd) = 51-65.

## DESCRIPTION

### *Male*

Body long, tapered at both ends. Cuticle with 18 main rings separated from by broad interzones, usually formed by four annules ; the anteriormost interzones and those on the tail are narrower, with two to three annules. Main rings with fine and coarse concretion material, interzones often covered with fine particles. In one male specimen the concretion material (desmos) of some main rings became loose and separated from the cuticle (fig. 3D). Underneath these concretion rings we observed three more or less swollen annules, the outer annules with the border folded, the middle annule bearing fine thorns.

Somatic setae arranged as follows : Holotype ♂, sub-dorsal, right side 1 3 5 7 9 11 13 16 18<sup>1</sup> 18 = 10 ; left side 1 3 5 7 9 11 13 15 18 18 = 10 — sub-ventral, right side 2 4 6 8 10 12 14 15 17 = 9 ; left side 2 4 6 8 10 12 14 16 16 = 9 (with sub-ventral setae on main rings 2 and 16, 17 in sub-lateral position). — Paratype ♂ 1, sub-dorsal, right side 1 3 5 7 9 11 13 16 18 (?) 19 = 10 ; left side 1 3 5 7 9 11 13 16 18 (?) 19 = 10 — sub-ventral, right side 2 4 6 8 10 12 14 15 17 = 9 ; left side 2 4 6 8 10 12 14 15 17 = 9 (with sub-ventral setae on main rings 2 and 17 in sub-lateral position). Somatic setae inserted on low peduncles. The sub-dorsal setae with large basal shaft ending on a small spatulate tip ; the sub-ventral setae being smaller, ending on a fine open tip. The sub-dorsal setae on the first main ring and on the terminal ring are elongated ; the sub-ventral setae become slightly longer posteriorly.

Head as wide as long, broadly rounded and anteriorly tapered ; its cuticle thickened and sclerotized in the narrower anterior part, in the posterior part covered by a thick layer of secretion and fine foreign material (except in the middle of the amphidial region). Labial region surrounded by a membrane. Cephalic setae, short, with fine central canal. They are inserted far anteriorly on the head, almost without peduncle. Amphids, large vesicular structures, extending from the labial region to the first main ring. The very small amphidial pore is posteriorly connected with a canal ending on an elevated cuticularized structure (bar) (fig. 3A). Ocelli, dark yellow rounded structures, situated at the level of main ring 4.

Stoma small. Oesophagus typical desmoscolleoid, terminally surrounded by the nerve ring. Oesophago-intestinal junction between main rings 1 and 2 or at the beginning of main ring 2. Front of intestine with narrower ventricular part, widening behind into a broad cylinder with small and large globules ; intestine overlapping the rectum posteriorly (fig. 3B, 3E).

1. Setae broken off.



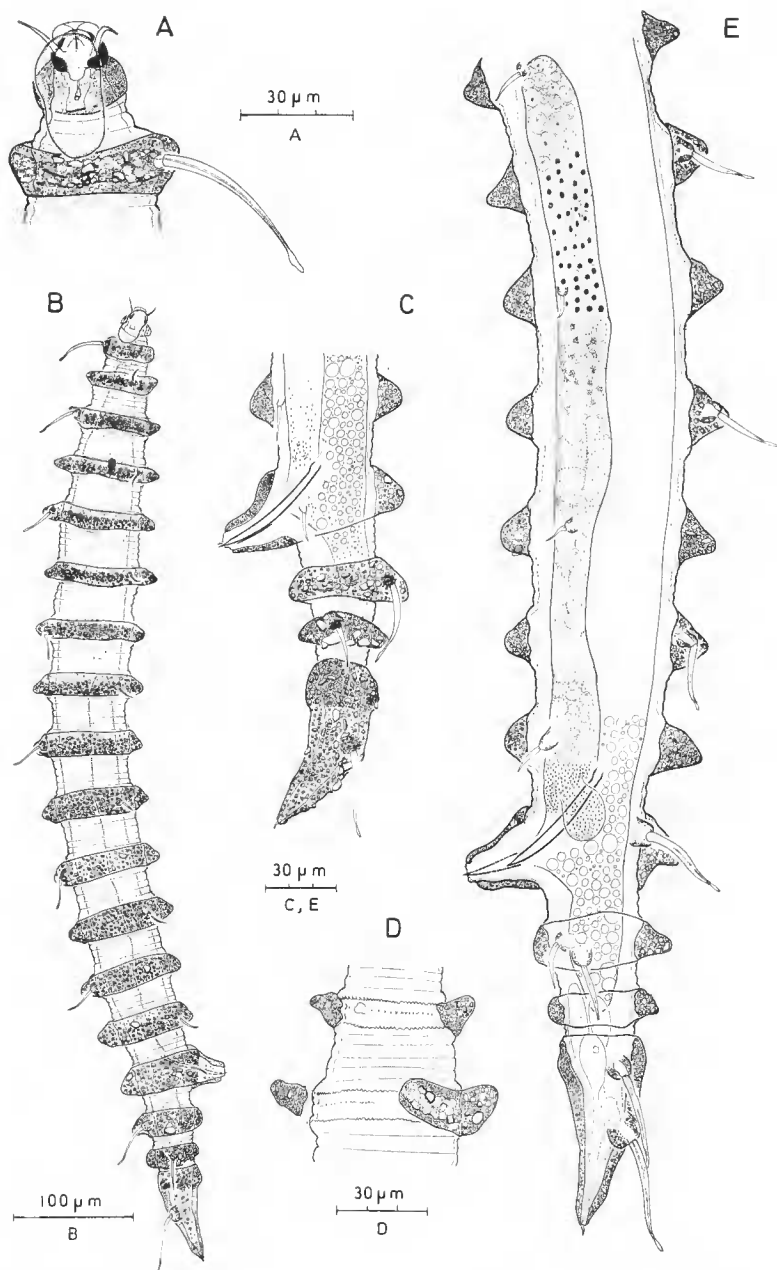


FIG. 3. — *Desmoscolex demerarae* sp. nov. : A, surface view of head (♂ holotype) ; B, holotype male, entire specimen ; C, posterior body region (♂ paratype) ; D, surface view of part of body wall with desmos partly removed (♂ paratype) ; E, male reproductive system and tail (holotype).

Reproductive system typical with one testis (DECRAEMER, 1975). Spicules 54  $\mu\text{m}$  long (55-56  $\mu\text{m}$  in paratypes), almost straight, narrowing distally to a pointed tip and proximally with a slightly marked capitulum. Gubernaculum 22  $\mu\text{m}$  long (20  $\mu\text{m}$  in a male paratype), thin structure parallel to the spicules; may be rather obscure. Cloacal tube largely protruding from the ventral body wall in main ring 15.

Tail with three main rings. Terminal ring with an indication of a non-separated main ring (see also the number of sub-dorsal setae). Three caudal glands observed. Phasmata not visible.

*Female* : not found.

TYPE LOCALITY : Demerara abyssal basin off French Guiana, station B, at 10°23.17'/46°45.47', at 4 850 m depth, collected on 29-IX-1980.

DIAGNOSIS : *Desmoscolex demerarae* sp. nov. is characterized by its head, anteriorly surrounded by a labial membrane and by the cuticularized structures in connection with the amphidial pores. It can also be distinguished by the number of main rings (18) and by its setal pattern with 10 pairs of sub-dorsal and 9 pairs of sub-ventral setae.

#### Subfamily TRICOMINAE LORENZEN

#### Genus **QUADRICOMOIDES** Decraemer

*Quadricomoides* Decraemer, 1976 : 90.

#### **Quadricomoides trilabiata** sp. nov.

(Figs. 4-5)

MATERIAL : 1 ♂ holotype (slide AN 334). — Paratypes : 1 ♂ (slide AN 324), 2 ♂♂ (slide AN 326), 1 ♂ (slide AN 320), 1 ♂ (slide AN 328), 2 ♀♀ (slide AN 332), 3 ♀♀ (slide AN 320), 1 ♀ (slide AN 322), 1 ♀ (slide AN 321), head male (slide AN 318).

MEASUREMENTS : *Holotype male* : L = 1 080, hd = 41  $\times$  40 (28), cs = 29, sv = 22-26, oes = 135, spic = 84, gub = 48, mbd = 102, (mbd) = 66, t = 173, tmr = 51, spinneret = 14, tmrw = 19, (tmrw) = 14. — *Paratype males* (n = 5) : L = 925-1 115, hd = 40-47  $\times$  37-42 (23-30), cs = 24-29, sv = 31-35, sd = 22-34, oes = 120-146, spic = 80-84, gub = 45-53, mbd = 103-122, (mbd) = 65-74, t = 171-176, tmr = 52-58, spinneret = 9.5-16, (tmrw) = 9.5-15, tmrw = 18-22. — *Paratype females* (n = 7) : L = 1 060-1 295, hd = 43-50  $\times$  40-48 (25-30), cs = 27-30, sv = 16-39, sd = 30-39, oes = 120-150, mbd = 105-125, (mbd) = 68-91, t = 175-198, tmr = 59-97, spinneret = 10-17, tmrw = 21-37, (tmrw) = 13-21, V = 55-59 %.

#### DESCRIPTION

Body long, tapered at both ends. Cuticle with 33 broad *Quadricoma* — like concretion rings with many coarse foreign particles (except in a female with 32 rings and a female with

34 rings). Inversion of direction of the concretion rings occurs within rings 22 or 23; the inversion, however, may be difficult to determine.

Head broad, tapered anteriorly to a large truncated end. Its naked cuticle is thickened and sclerotized, forming a kind of helmet. The head is followed by a narrower 'neck-zone' with thin cuticle covered by foreign material. Anterior end of head triradially symmetric with three labial areas (lips). In 'en face' view the head is rounded triangular (fig. 4a). A large triradial mouth-opening nearly reaches the border of the helmet and divides the head terminally in three triangular sectors or lips (fig. 4e). The inner margins of these sectors bear minute spines, not observed in lateral view. The sclerotized outer margin of the lip-sectors is slightly indented opposite to the endings of the six labial sensilla, two in each sector. At the level of the insertion of the cephalic setae, the head is more or less quadrangular. Underneath the amphids, the head-cuticle is irregular, lumpy (fig. 4d).

Cephalic setae, about as long as the head (neck-zone not included), inserted on very low peduncles halfway along the head length. They taper distally to an open tip and are apparently flanked over their whole length by a membrane (fig. 4d). At their base they are in connection with glandular structures. Somatic setae homogeneous, with fine central canal and open tip, inserted on peduncles surrounded by foreign material. Somatic setae often broken off in the specimens available, and due to the large amount of foreign material the insertion became obscure. Consequently, the arrangement of somatic setae cannot be given with certainty. The largest number of somatic setae observed on each body side is 10 sub-ventral setae in both sexes and 6 sub-dorsal setae in male, 8 sub-dorsal setae in female. The somatic setae become longer posteriorly.

Amphids broad, rounded, thick-walled vesicular structures, surrounding nearly completely the head (neck-zone excluded). Amphidial pores situated at the posterior border of the sclerotized head wall. Ocelli large, rounded, brownish structures at level of concretion rings 6 or 7.

Oesophagus typical for the genus (DECRAEMER, 1976): consisting of a thin-walled stomatal part, a broader cylindrical anterior part reaching the level of the nerve ring, and a posterior part with asymmetric bulb or swelling, consisting of an internal differentiation and an outer muscular wall. The nerve ring surrounds the oesophagus at the end of the second or at the third concretion ring. The excretory duct of the dorsal oesophageal gland is conspicuously swollen in the anterior part of the oesophagus and occupies nearly the entire dorsal wall. At the level of the asymmetric bulb the oesophageal lumen is shifted ventrally. The oesophago-intestinal junction occurs at the end of concretion ring 4 or opposite concretion ring 5. A large and pale rounded organ lies dorsally along the narrower anterior part of the intestine. Posterior to this structure the intestine becomes wider. Intestine without post-rectal blindsac. From the posterior end of the ocelli on, or shortly behind them, the ventral intestinal wall contains dark red-brownish pigmented granules, forming a ventral strain along the intestine up to the level of concretion ring 27, i.e. shortly in front of the anus or cloaca (fig. 5B, 5E). This ventral strain of pigment-granules in the intestinal wall may be enlarged at the beginning and at the end. This pigment-strain was present in all specimens available.

Tail tapered posteriorly. Terminal ring about double the length of the former ring, ending on a naked narrow spinneret, 9.5-17  $\mu$ m long. Phasmata not observed.

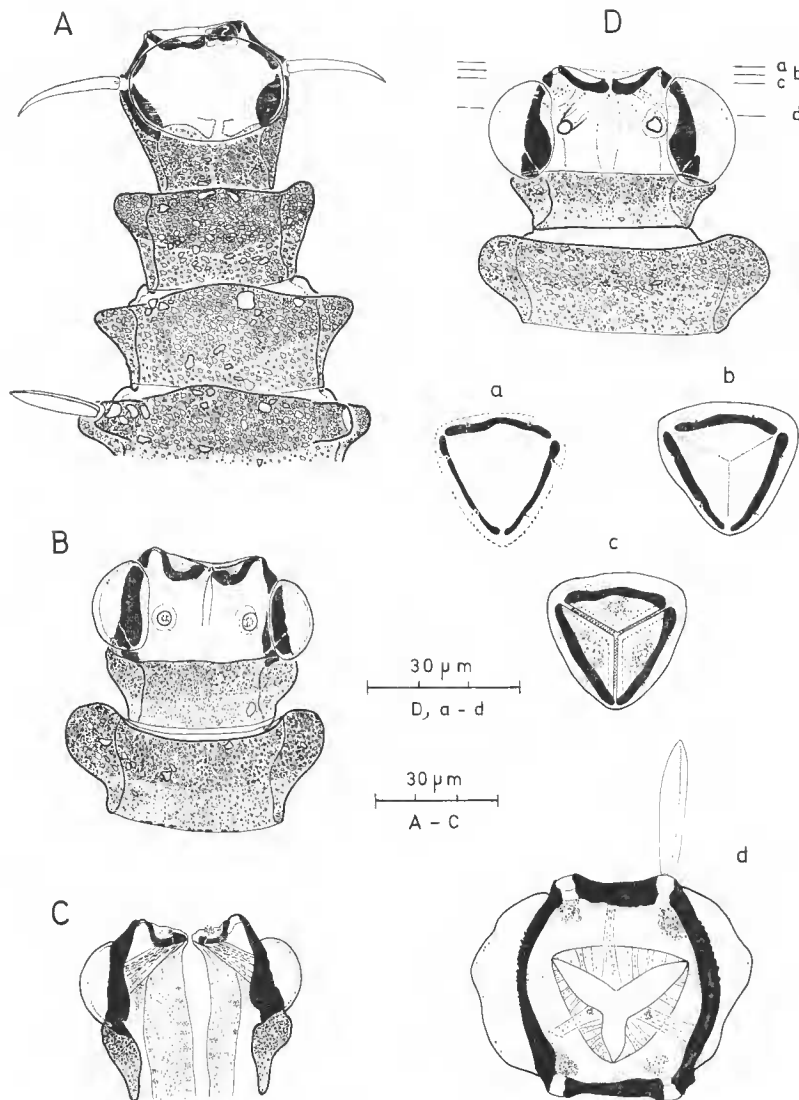


FIG. 4. — *Quadricomoides trilabiata* sp. nov. : A, surface view of head and anterior body rings (♂ holotype) ; B, surface view of ventral side of head (♀ paratype) ; C, head region (♀ paratype) ; D, surface view of ventral side of head (♂ paratype) showing levels at which the transverse optical sections a — d were made.

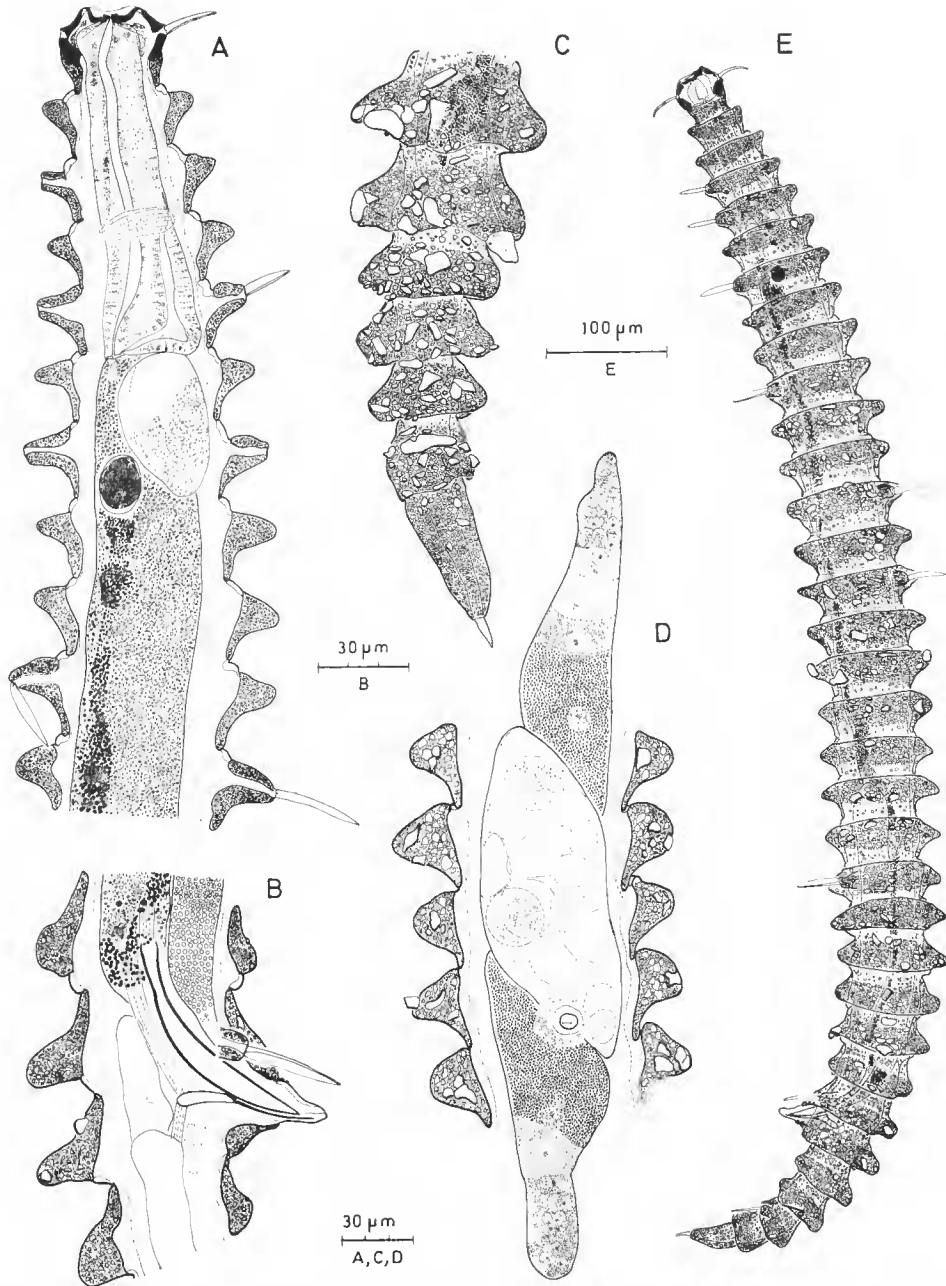


FIG. 5. — *Quadricomoides trilabiata* sp. nov. : A, anterior body region ( $\text{♂}$  paratype) ; B, male copulatory apparatus (holotype) ; C, surface view of tail ( $\text{♀}$  paratype) ; D, ventral view of female reproductive system (paratype) ; E, holotype male, entire specimen.

### *Males*

Two testes, right one reflexed. Spicules broad, arcuate, proximally tapered to a slightly marked capitulum, 84  $\mu$ m long (80-84  $\mu$ m in paratypes). Gubernaculum consisting distally of a thin part along the spicules and proximally of a larger apophyse, orientated dorso-caudally and 17  $\mu$ m long (14-16  $\mu$ m in paratypes). Cloaca between concretion rings 27-28. Tail with six concretion rings.

### *Females*

Reproductive system didelphic-amphidelphic. Two spermathecae. Both uteri join in a large sac with large cells. Vulva located between concretion rings 19 and 20, i.e. at 55-59 % of the total body length from the anterior end. Anus in main ring 29. Tail with 5 concretion rings (6 rings in a female with 34 body rings, 4 rings in a female with 32 rings).

TYPE LOCALITY : Demerara abyssal basin off French Guiana, at 10°23.17'/46°45.47', at 4 850 m depth, collected on 29-IX-1980.

DIAGNOSIS : *Quadricomoides trilabiata* sp. nov. has 33 *Quadricoma*-like concretion rings, a broad rectangular sclerotized head with covered "neck-region", three lips and fine spines lining the buccal cavity. It is also characterized by its long body, the broad spicules with slender capitulum, a gubernaculum with apophyses and sexual dimorphism in the number of concretion rings on the tail : 6 in males, 5 in females.

### DIFFERENTIAL DIAGNOSIS

*Quadricomoides trilabiata* sp. nov. closely resembles *Q. pedunculata* Deeraemer, 1976, in having a similar head-structure and a comparable copulatory apparatus. It differs from *Q. pedunculata* by the structure and length of the oesophagus (measured in number of concretion rings) and by its longer body length, longer spicules and gubernaculum and by the absence of conspicuously high peduncles of insertion of somatic setae.

*Q. trilabiata* is comparable with *Q. coomansi* Deeraemer, 1976, in the structure of the oesophagus and of the female reproductive system. It differs from *Q. coomansi* in head-shape, in a longer body and in the structure of the copulatory apparatus.

### ***Quadricomoides labiosus* sp. nov.**

(Figs. 6-7)

MATERIAL : 1 ♀ holotype (slide AN 335). — Paratypes : 1 ♀ (slide AN 319), 1 ♀ (slide AN 321), 1 ♂ (slide AN 332), head female (slide AN 319).

MEASUREMENTS : *Holotype female* : L = 1 645, hd = 44 × 46 (29), cs = 23, sd<sub>23</sub> = 25, sd<sub>34</sub> = 25, sv<sub>2</sub> = 16, sv<sub>4</sub> = 24, sv<sub>11</sub> = 30, sv<sub>29</sub> = 30, sv<sub>32</sub> = 25, sv<sub>34</sub> = 24, oes = 265, t = 255, tmr = 54, mbd = 142, (mbd) = 93, V = 52 %. — *Paratype females* (n = 2) : L = 1 375-1 590, hd = 44-45 × 48-49 (31), cs = 20, sv<sub>2</sub> = 14, sv<sub>11</sub> = 27, sv<sub>19</sub> = 26, sv<sub>26</sub> = 27, sv<sub>31</sub> = 24, sv<sub>34</sub> = 21, sd<sub>15</sub> = 22, sd<sub>19</sub> = 25, sd<sub>32(33)</sub> = 22-29, oes = 205-270, t = 210-220, tmr = 40-64, tmrw = 22-31, (tmrw) = 12-21. — *Paratype male* (n = 1) : L = 1 350, hd = 45 × 44 (28), cs = 26, sv<sub>2</sub> = 16, sv<sub>10</sub> = 25, sv<sub>13</sub> = 26, sv<sub>22</sub> = 27, sd<sub>12</sub> = 24, sd<sub>17</sub> = 23, oes = 240, t = 205, tmr = 56, tmrw = 28, (tmrw) = 16, spic = 86, gub = 53, mbd = 137, (mbd) = 87.

# DESCRIPTION

Body long, relatively broad, tapered at both ends. Cuticle with 37 broad *Quadricoma*-like concretion rings (36-37 rings in female paratypes, 36 rings in male paratype), with many small and coarse foreign particles. Inversion of direction of the concretion rings within ring 27.

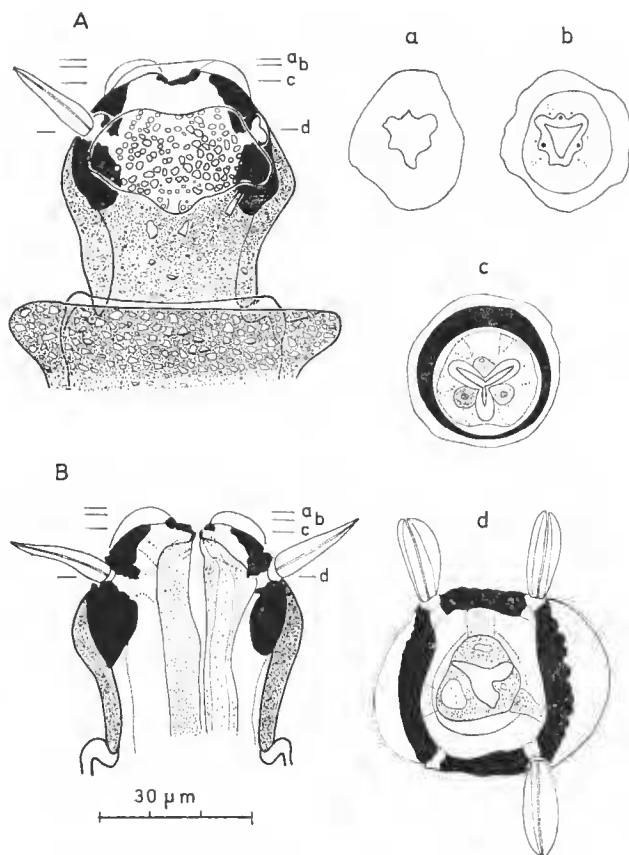


FIG. 6. — *Quadricomoides labiosus* sp. nov. : A, surface view of head (♀ paratype) showing levels at which the transverse optical sections a — d were made ; B, head region (♀ paratype) showing levels at which the transverse optical sections a — d were made.

Head broad, rounded, tapered to a truncate anterior end. Anteriorly, its naked cuticle is thickened and sclerotized, forming a kind of helmet, posteriorly followed by a neck-zone with a thin non-sclerotized cuticle covered by fine concretion particles. Head end surrounded by a membrane, is triradially symmetric with three labial sectors. In 'en face' view mouth opening triangular (fig. 6b). Labial sectors with slight outer inden-

tations for the endings of the six labial sensilla. At the level of the insertions of the cephalic setae, the head is about quadrangular. Underneath the amphids the head-cuticle is conspicuously irregular, lumpy (fig. 6A, 6d).

Cephalic setae, stout and short, inserted on minute peduncles, halfway the length of the sclerotized helmet. They taper distally to an open tip and are apparently surrounded over their whole length by a membrane (fig. 6d). Somatic setae inserted on low peduncles are homogeneous. They are often broken off, however, the arrangement of the somatic setae could be determined according to the setae and the insertion places.

Amphids broad rounded vesicular structures, largely covering the lateral sides of the helmet. Amphidial pore situated at the posterior border of the helmet. Ocelli, large, brownish structures lying opposite concretion rings 8 or concretion rings 8 and 9.

Oesophagus consisting of a thin-walled stomatal part, a wide cylindrical anterior part to the level of the nerve ring and a posterior part with dorsal asymmetric bulb or swelling. The nerve ring surrounds the oesophagus at the posterior end of concretion ring 4. In consecutive transverse optical sections of the stomatal region, three glandular structures (oesophageal glands ?) were observed outside the stomatal region (fig. 6e), ending in the lip region (fig. 6b). In lateral view excretory duct of dorsal oesophageal gland well discernible. Oesophago-intestinal junction occurs at the level of concretion ring 7. A pale rounded organ lies dorsally along the beginning of the intestine. Intestine without post-rectal sac. From the level of the oesophagus the ventral intestinal wall contains a strain of small granules, pigmented or not, reaching to ring 29, close to the anus or cloaca.

Tail tapered posteriorly, with 6 concretion rings (except 5 rings in a female with 36 body rings). Terminal ring, twice as long as former ring, ends on a very short naked spinneret. Phasmata not observed.

### *Females*

Somatic setae arranged as follows : holotype female with 37 concretion rings : sub-dorsal, right side 3 7 15 17 24 28 31 = 7 ; left side 3<sup>1</sup> 7 12 19<sup>1</sup> 23 25 34 = 7 — sub-ventral, right side 2 4<sup>1</sup> 6 9 11 13 16 19 23 26 29 31 34 = 13 ; left side 2 4 6 8 11 16 18 21 24 27 29 32 34 = 13. — Paratype female with 36 concretion rings : sub-dorsal, right side 3 7 10 15 18 27 34 = 7 ; left side 3 7<sup>1</sup> 11<sup>1</sup> 17 22 27 32 = 7 — sub-ventral, right side 2 4<sup>1</sup> 6<sup>1</sup> 11 13<sup>1</sup> 16<sup>1</sup> 19<sup>1</sup> 22<sup>1</sup> 24<sup>1</sup> 27 30 34<sup>1</sup> = 13 ; left side 2 4<sup>1</sup> 6<sup>1</sup> 8<sup>1</sup> 11 13 16 19 22<sup>1</sup> 25<sup>1</sup> 28 32<sup>1</sup> 34 = 13.

Reproductive system didelphic-amphidelphic. Two spermathecae. Vulva situated between concretion rings 19 and 20, i.e. at 52 % of the total body length from anterior end in the holotype. Anal tube protruding from the ventral body wall in concretion ring 31.

### *Male*

Somatic setae arranged as follows : sub-dorsal, right side 2 5 — 16 23 28 34 = 6 ; left side 2 6 12 17 22 27 33 = 7 — sub-ventral, right side 2 4 7 9 11 13 16 18 21 23 26 30 34 = 13 ; left side 2 4<sup>1</sup> 5<sup>1</sup> 7 8 10 11 12 14 16 18 20 22 26 30<sup>1</sup> 34 = 16.

1. Setae broken off.



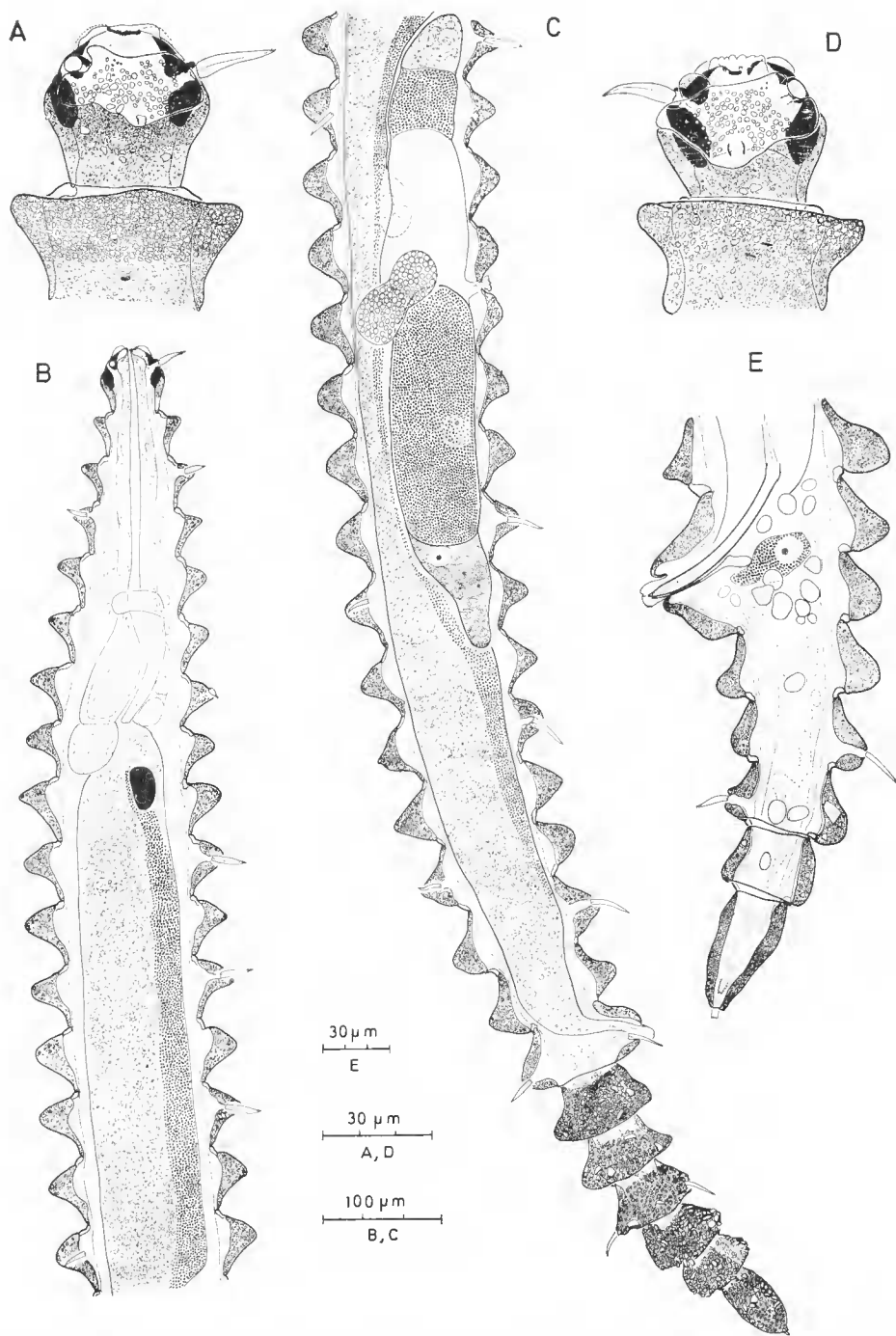


FIG. 7. — *Quadricomoides labiosus* sp. nov. : A, surface view of head (♀ holotype) ; B and C, together representing the holotype female, entire specimen ; D, surface view of head (♂ paratype) ; E, posterior body region (♂ paratype).

Two testes. Left (?) one reflexed. Spicules 86  $\mu$ m long, with slightly offset capitulum and distally tapered to a pointed tip. Gubernaculum consisting of a thin distal part along the spicules and a dorso-caudally orientated apophyse, 15  $\mu$ m long. Cloaca between concretion rings 30 and 31.

TYPE LOCALITY : Demerara abyssal basin off French Guiana, at 10°23.17'/46°45.47', at 4 850 m depth, collected on 29-IX-1980.

DIAGNOSIS : *Quadricomoides labiosus* sp. nov. is characterized by its head structure with triradially symmetric anterior end with three lip sectors, surrounded by a labial membrane ; by the lumpy outlook of the head cuticle underneath the amphids. It can also be distinguished by the large body length, the structure of the oesophagus and oesophageal glands and by the shape of the copulatory apparatus.

#### REMARK

The position of *Quadricomoides labiosus* sp. nov. within the genus *Quadricomoides* is questionable. Its peculiar structure of the labial and stomatal region and the very complicated structure of the oesophageal bulb and the oesophageal glands differentiate this species from all other species of the genus. Due to the small number of specimens found, *Quadricomoides labiosus* is temporary classified within the genus *Quadricomoides* until more information becomes available.

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